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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,334	12/06/2001	Lin Xu	4208-4057	3436

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EXAMINER

SUAZO, RAINIER A

ART UNIT	PAPER NUMBER
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2144

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/008,334

Applicant(s)

XU ET AL.

Examiner

Rainier Suazo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/29/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-28 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurst et al. (U.S. Patent Number 6,131,123) hereinafter referenced to as Hurst in view of Khan et al. (U.S. Patent Application Publication Number **US 2002/0143951 A1**)

Hurst taught an efficient message distribution to subsets of large computer networks using multicast for near nodes and unicast for far nodes. The sending computer determines the circumstances under which a combination of multicast and unicast messages are efficient by determining that many recipient computers are near the sending computer and that few recipient computers are far. See the **abstract**.

Khan taught a method and system for sending multicast information to a user comprising agents, network programs that reside on multicast-enabled computer. The agents receive multicast data packets sent to members of a multicast group and repackage the multicast information into a unicast data packet and forward the unicast

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data to a client registered with the agent. Clients may register with an agent by sending an IGMP join message. See the **abstract**.

Regarding claim **1-12**, Hurst taught a computer system that that determines whether a subset of a reception group should receive said service via a unicast link or via a multicast link (**abstract, column 4 lines 3-12, column 5 lines 56-63**), and further taught determining the suitability of the option (**column 7 lines 1-47 and column 8 lines 54-65**).

Hurst's disclosure is embodied in a computer system comprising a memory, a processor and program code wherein the program code stored in the memory is to be executed by the processor (**column 4, lines 35-53**) for achieving the steps of the invention. Note that the above limitations depicts in a general fashion a general purpose computer architecture well known in the art at the time of the invention to be used to perform methods steps and typically called computer, server, IBM compatible PC or the like.

Hurst did not expressly disclose forwarding to a reception group; and performing determination steps based on a change in the cellular distribution. However, Hurst disclosure performs determination steps for every message making different determinations for different compositions composition of the multicast group (**column 5, lines 57-63**).

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Khan taught the use of agents (135) that forward unicast data packet to a client registered with the agent in **paragraph 0012**. Khan expressively taught techniques for "New Client Joining Multicast Group" and "Client Leaving Multicast Group" [0029-0033] effectively depicting a way to update the multicast group membership.

Khan taught "upon a change in the composition of the reception group or in the cellular distribution of the reception group" as a mechanism for detecting a change in the composition or distribution of the reception groups and triggering an action in paragraph 0033, in particular in **lines 4-20**, wherein Khan recites:

"For example, a CISCO multicast router may **periodically transmit** a client membership **query message** in order to **determine which multicast groups have members** on the router's attached networks. As a multicast client, the agent will be a multicast member on a router's attached networks, such as a CISCO router's attached network as mentioned in the example. This router query message may cause the agent to poll or query its attached clients (i.e., the unicast clients for whom the agent has been designated to provide multicast service). **If an attached unicast client does not respond** to the agent's query message, the agent may **stop** forwarding multicast packets to the client. If an attached unicast client responds to the agent's query message but does not include a multicast group in its response message, the agent may **stop** forwarding multicast packets from the omitted multicast group to the client. Where a router query message causes an agent to poll or query its attached clients, the agent may respond to the router query message according to the responses the agent received from its attached clients. In this example, **the agent may respond using an IGMP report message to let the router know which multicast groups it wants to receive packets from**. The agent may also periodically, without initiation by a router membership query message, poll or send a query to its attached unicast clients to determine which multicast groups the agent needs to belong to and to whom the agent needs to forward information from those multicast groups."
(emphasis added)

Hurst and Khan taught inventions in the same field of endeavor, related to multicast and unicast data transmission to improve network resources utilization. See "FIELD OF INVENTION" in Hurst and Khan. Note that distributing a message to a subset of clients defines multicasting.

It would have been obvious to one of ordinary skill in the art working with Hurst at the time the invention was made to modify the system of Hurst with the teachings of Khan. Hurst motivated the exploration of the art of multicasting and unicasting in **column 1 lines 19-46**. Khan motivated the exploration of the art of multicasting and unicasting in paragraphs **0002, 0003, 0005 and 0007**. This modification would have improved Hurst disclosure with the teachings of Khan **[0012]** providing a system that sends or forwards a multicast or a unicast message, using a forward agent.

Furthermore, **Khan** effectively taught that at any time the system can determine the need to change the transmission scheme (e.g. if the client does not respond) and trigger an action that changes the transmission scheme (e.g. stopping forwarding to such client or agent) which is commensurate with *"upon a change in the composition of the reception group or in the cellular distribution of the reception group"* (Khan: paragraph **0033**). **Hurst** taught "deciding whether a subset of said reception group of said reception group should receive said service via a unicast link or via a multicast link", for example, in **column 5, lines 57-63 and column, lines 1-14 and 35-47**. **Hurst** explicitly taught a succession of steps wherein the test step **304** is performed prior the sending step **306**. Since any change in the organization may be an opportunity for optimizing

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transmission burden in the network (a desirable feature taught, for example, by **Hurst in column 4, lines 4-23**), one of ordinary skill in the art would have used the teachings of Khan ([0033]) to trigger the decision mechanism of Hurst (**column 5, lines 57-63 and column, lines 1-14 and 35-47**). Therefore, Hurst modified by Khan taught *upon a change in the cellular distribution of the reception group or upon a change in the composition of the reception group (Khan: 0033), deciding whether a subset of said reception group of said reception group should receive said service via a unicast link or via a multicast link (Hurst: column 5, lines 57-63 and column, lines 1-14 and 35-47)*.

Regarding the limitation "*selecting from among available cellular distributions for said reception group*", this limitation was taught by Hurst in **column 9, lines 8-26**, wherein a description of **figure 5 (5A and 5B)** is provided. This fragment of Hurst described measuring a relation between reachable nodes and the reachable interested nodes based one of a plurality of "possible value of the TTL parameter", which in turn is used to determining the reachable nodes; therefore, each change in the TTL parameter produce a different set of reachable nodes which is commensurate with a different distribution for said reception group as claimed.

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3. Claims **13-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurst et al. (U.S. Patent Number **6,131,123**) hereinafter referenced to as Hurst in view of Khan et al. (U.S. Patent Application Publication Number **US 2002/0143951 A1**) further in view of Marzo et al. (Multicast Algorithms Evaluations Using an Adaptive Routing in ATM Networks) hereinafter referenced to as Marzo and further in view of Stanforth (U.S. Patent Application Publication No. **US 2002/0058502 A1**) hereinafter referenced to as Stanforth.

Marzo taught multicast algorithms for routing in ATM networks. Marzo describes that for each new call the network must select a path that has sufficient bandwidth available to support the new connection. Marzo described bandwidth considerations, connection acceptance control and routing, adaptive routing with pre-evaluated tables and multicast issues as well as cost analysis. See the **abstract**.

Stanforth taught an ad-hoc, peer-to-peer radio access system for cellular communications systems and described in the background that spectral efficiency is a key factor. The fact that this information was described in the background of an application related to improving efficiency of data network transmission is evidence that the importance of such factor was well known in the art at the time of the invention. See the **abstract and the background of the invention**.

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Regarding claim **13-16**, Hurst modified by Khan taught the invention substantially as claimed. However the combination of Hurst and Khan did not expressively disclose the taking into account the bandwidth and the spectrum efficiency factor of each of each access system and per-unit-cost of bandwidth.

Marzo, in the same filed of invention, taught taking into account the bandwidth (**page 2/7 paragraph 3**). Marzo taught the importance and use of cost measures to determine optimal routes (**page 5/7**).

Stanforth taught the importance of considering spectral efficiency as a key economic factor in wireless communications because of the limited availability and high costs of spectrum **[0005]**.

Hurst, Khan, Marzo and Stanforth disclosed information in the same field of endeavor, related to improve scarce network resources utilization.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to further modify the combined system of Hurst and Khan with the teachings of Marzo and Stanforth. Motivation to combine is found in Hurst and Khan disclosures and both motivated the exploration of the art of multicasting and unicasting (see **column 1 lines 19-46 0002 in Hurst; and 0003, 0005 and 0007 in Khan**), in addition, Hurst motivated the exploration of the art of solving excessive message traffic

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throughout the computer network (**column 1 lines 35-46, column 2 lines 54-57 and column 8 lines 54-65**). This combination would have improved the combination of Hurst and Khan, in order to provide a system that more accurately determines optimal transmission routes by taking into account bandwidth costs and spectral spectrum efficiency (see **page 5/7 in Marzo and [0005] in Stanforth**).

Regarding claims **17 and 18**, Hurst taught considering the percentage of terminals using the link that would be served using the bandwidth (**fig. 3, column 4 lines 5-12, column 5 lines 54-63 and column 6 lines 1-10**). One of ordinary skill in the art would understand that the term 'few' needs to be expressed in the form of mathematical calculations in order to be interpreted by a processor executing a computer executable readable medium and using average or percentage calculation is a matter of choice in order to provide a simple measure representing what is few or more. Mathematical calculations are inherent in the determination of 'few'.

Regarding claims **19-28**, Khan taught the use of IGMP join message **[0027-0030]**, which by definition includes: a) group address (networks available), b) a designated router or a way to determine a designated router; and c) the multicast address that identifies a particular transmission session, (session by definition have a start time and an ending time).

Response to Argument

Applicant's arguments submitted on 05/02/2005 are found not persuasive as per the following discussion.

Applicant argues that the following limitation are not found in the cited art either singly or combination:

1. "...upon a change in the cellular distribution of the reception group, deciding whether a subset of said reception group of said reception group should receive said service via a unicast link or via a multicast link",
2. "... upon a change in the composition of the reception group, deciding whether a subset of said reception group should receive said service via a unicast link or via a multicast link"; and
3. "...selecting from among available cellular distributions for said reception group".

Examiner respectfully disagrees and further clarifies how the combination of the cited art taught such limitations.

The argued limitations (1 and 2) "upon a change in the composition of the reception group or in the cellular distribution of the reception group" is basically emphasizing that changes in the composition or distribution of such reception group are a trigger for the actions described later. Detecting a change in the composition or distribution of the

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reception groups was taught by Khan in paragraph 0033, in particular in lines 4-20, wherein Khan recites:

"For example, a CISCO multicast router may **periodically transmit** a client membership **query message** in order **to determine which multicast groups have members** on the router's attached networks. As a multicast client, the agent will be a multicast member on a router's attached networks, such as a CISCO router's attached network as mentioned in the example. This router query message may cause the agent to poll or query its attached clients (i.e., the unicast clients for whom the agent has been designated to provide multicast service). **If an attached unicast client does not respond** to the agent's query message, the agent may **stop** forwarding multicast packets to the client. If an attached unicast client responds to the agent's query message but does not include a multicast group in its response message, the agent may **stop** forwarding multicast packets from the omitted multicast group to the client. Where a router query message causes an agent to poll or query its attached clients, the agent may respond to the router query message according to the responses the agent received from its attached clients. In this example, **the agent may respond using an IGMP report message to let the router know which multicast groups it wants to receive packets from**. The agent may also periodically, without initiation by a router membership query message, poll or send a query to its attached unicast clients to determine which multicast groups the agent needs to belong to and to whom the agent needs to forward information from those multicast groups."
(emphasis added)

Khan, as per the above excerpt, effectively taught that at any time the system can determine the need to change the transmission scheme (e.g. if the client does not respond) and trigger an action that changes the transmission scheme (e.g. stopping forwarding to such client or agent) which is commensurate with "upon a change in the composition of the reception group or in the cellular distribution of the reception group".

The second part of the argued limitations (1 and 2) "deciding whether a subset of said reception group of said reception group should receive said service via a unicast

link or via a multicast link", was taught by Hurst, for example, in **column 5, lines 57-63 and column, lines 1-14 and 35-47**. Hurst explicitly taught a succession of steps wherein the test step **304** is performed prior the sending step **306**. Since any change in the organization/arrangement of the node may be an opportunity for optimizing transmission burden in the network (a desirable feature taught, for example, by Hurst in column 4, lines 4-23), one of ordinary skill in the art would have used the teachings of Khan ([**0033**]) to trigger the decision mechanism of Hurst (**column 5, lines 57-63 and column, lines 1-14 and 35-47**). Therefore, Hurst modified by Khan taught upon a change in the cellular distribution of the reception group or upon a change in the composition of the reception group (Khan: **0033**), deciding whether a subset of said reception group of said reception group should receive said service via a unicast link or via a multicast link (Hurst: **column 5, lines 57-63 and column, lines 1-14 and 35-47**).

Regarding the argued limitation (3) "selecting from among available cellular distributions for said reception group", this limitation was taught by Hurst in **column 9, lines 8-26**, wherein a description of **figure 5 (5A and 5B)** is provided. This fragment of Hurst described measuring a relation between reachable nodes and the reachable interested nodes based one of a plurality of "possible value of the TTL parameter", which in turn is used to determining the reachable nodes; therefore, each change in the TTL parameter produce a different set of reachable nodes commensurate with a different distribution for said reception group as claimed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

If further prosecution on the merits of the instant application is pursued, Applicant is encouraged to further incorporate into the independent claims the details of the instant that may help to differentiate the instant claimed invention from the cited art. Applicant is further encouraged to point out where in the specifications is found the support for any future amendments to the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rainier Suazo whose telephone number is (571) 272-3931. The examiner can normally be reached on Monday through Friday, 8:00-4:30..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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